

40V N-Channel Mosfet

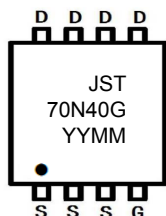
FEATURES

- $R_{DS(ON)} \leq 2.1m\Omega$ (1.7m Ω Typ.)
@ $V_{GS}=10V$
- $R_{DS(ON)} \leq 4.8m\Omega$ (3.0m Ω Typ.)
@ $V_{GS}=4.5V$
- AEC Q101 qualified
- Green Product (RoHS compliant)
- 100% UIS TEST

APPLICATIONS

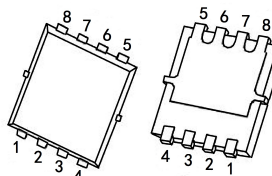
- Automotive Lighting
- Automotive Windows
- Automotive Charger
- Power Management
- PWM Applications

MARKING



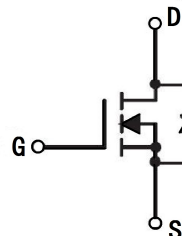
YYMM:Date Code(year & month)

PDFN5*6-8L



1: S 3: S 5: D 7: D
2: S 4: G 6: D 8: D

N-CHANNEL MOSFET



MAXIMUM RATINGS (Tc=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current @ $V_{GS}=10V$ <small>note1</small>	115	A
I_{DM}	Pulsed Drain Current <small>note2</small>	460	A
P_D	Power Dissipation	50	W
E_{AS}	Single Pulsed Avalanche Energy <small>note3</small>	484	mJ
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3	°C/W
T_J	Junction Temperature	175	°C
T_{STG}	Storage Temperature Range	-55 to +175	°C

MOSFET ELECTRICAL CHARACTERISTICS Tc=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, V _{GS} = 0V, T _J = 25°C	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = 250μA	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source On-Resistance ^{note4}	V _{GS} =10V, I _D =25A	-	1.7	2.1	mΩ
		V _{GS} =4.5V, I _D =20A	-	3.0	4.8	mΩ
Dynamic Characteristics ^{note5}						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} = 0V f = 1.0MHz	-	2631	-	pF
C _{oss}	Output Capacitance		-	558	-	pF
C _{rss}	Reverse Transfer Capacitance		-	278	-	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	2.4	-	Ω
Q _g	Total Gate Charge	V _{DS} =20V, I _D =20A V _{GS} =10V	-	43	-	nC
Q _{gs}	Gate-Source Charge		-	13	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	5.6	-	nC
Switching Characteristics ^{note5}						
t _{d(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =20V R _G =3Ω, I _D =20A	-	10.3	-	ns
t _r	Turn-On Rise Time		-	23.8	-	ns
t _{d(off)}	Turn-Off Delay Time		-	41	-	ns
t _f	Turn-Off Fall Time		-	18.5	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _{SD} =20A T _J = 25°C	-	-	1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _S =10A	-	48	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt =100A/μs	-	55	-	nC

- Notes: 1. TC=25°C Limited only by maximum temperature allowed
2. PW≤10μs, Duty cycle≤1%
3. EAS condition T_J=25°C, V_D=20V, V_G=10V, I_D=44A, L=0.5mH
4. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%
5. Guaranteed by design, not subject to production

TYPICAL PERFORMANCE CHARACTERISTICS

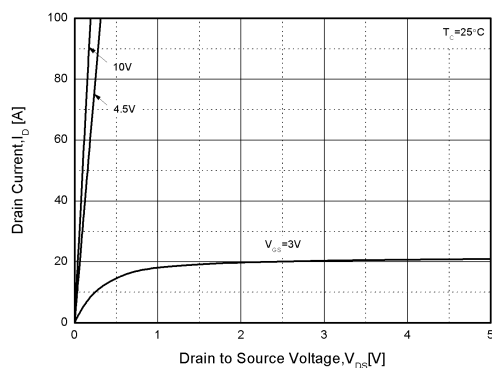


Figure1. Output Characteristics

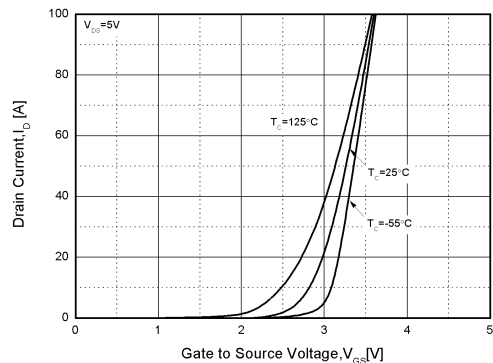


Figure2. Transfer Characteristics

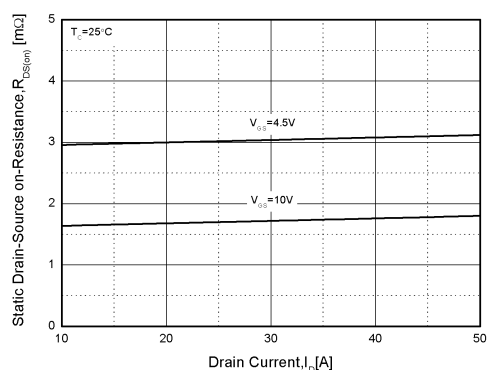


Figure3. Rdson-Drain Current

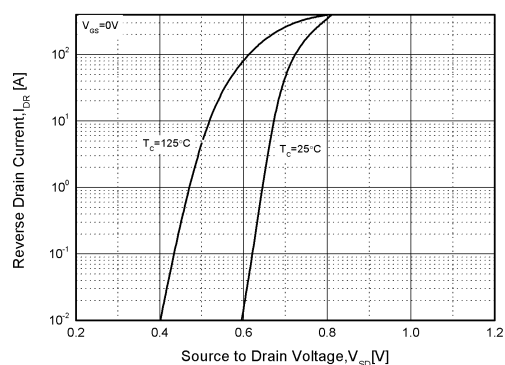


Figure4. Typical Source-Drain Diode Forward Voltage

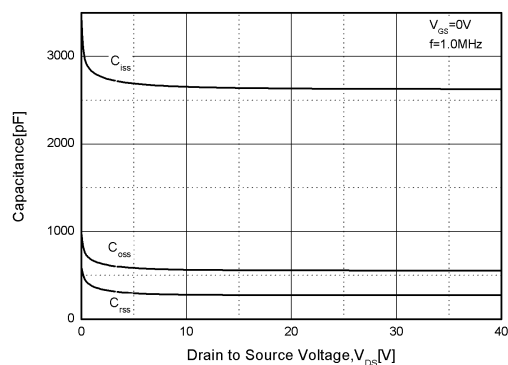


Figure5. Capacitance Characteristics

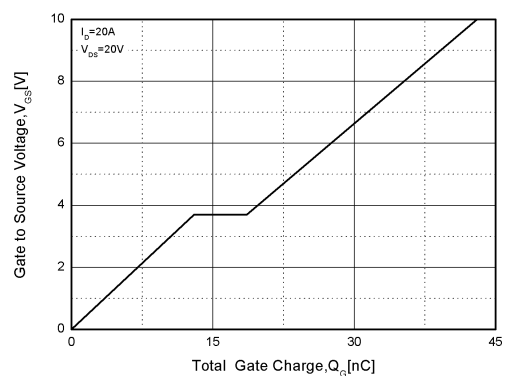


Figure6. Gate Charge

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

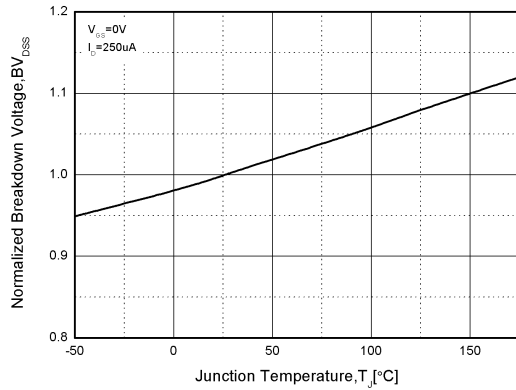


Figure7. Normalized Breakdown Voltage vs. Temperature

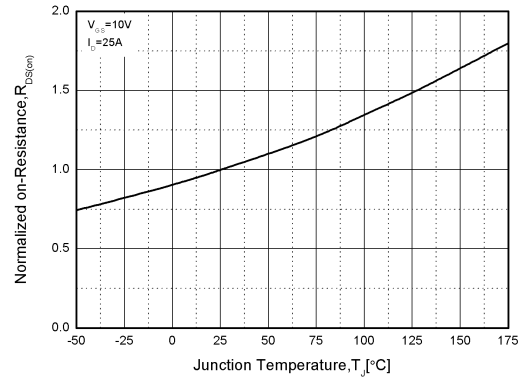


Figure8. Normalized on Resistance vs. Temperature

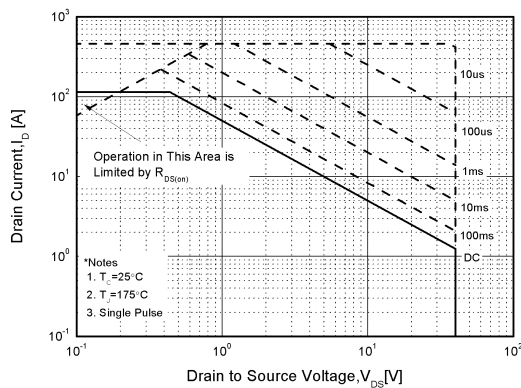


Figure9. Safe Operation Area

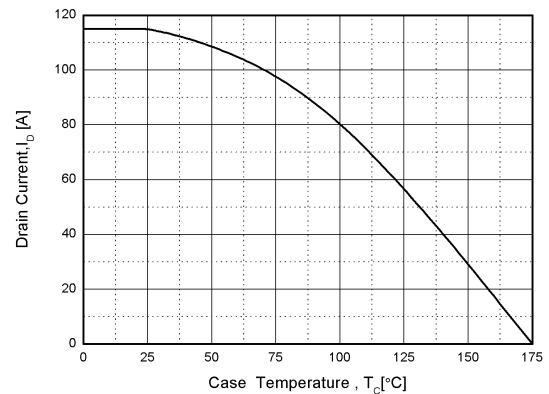


Figure10. Drain Current vs. Case Temperature

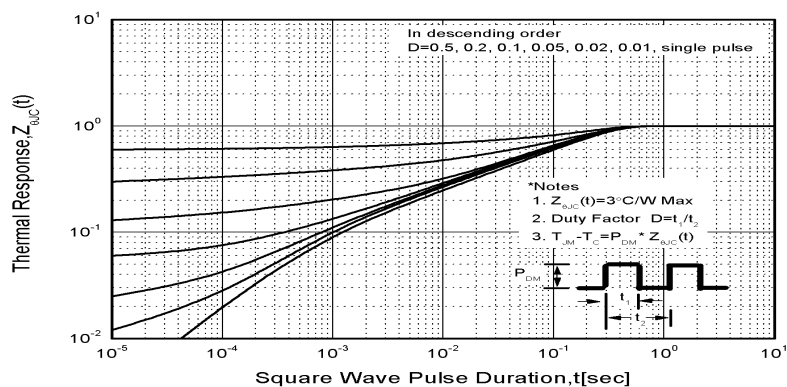
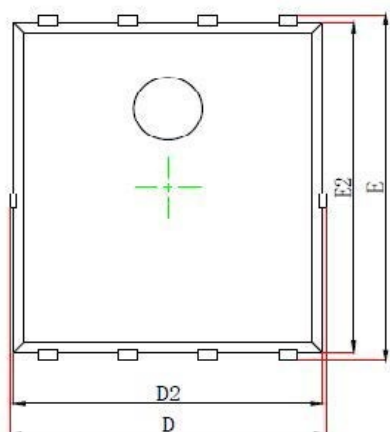
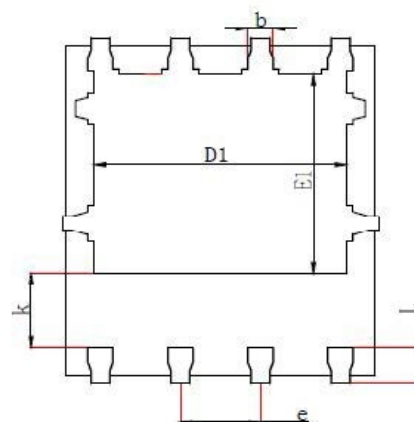


Figure11. Transient Thermal Response Curve

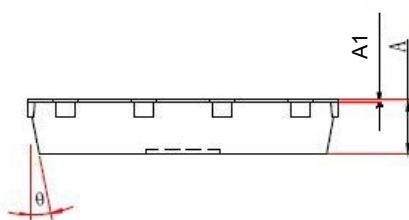
PDFN5*6-8L PACKAGE OUTLINE DRAWING



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
A1	0.000	0.05	0.000	0.002
D	-	5.4	-	0.212
E	-	6.200	-	0.244
D1	3.900	4.200	0.153	0.165
E1	3.350	3.650	0.132	0.144
D2	4.800	5.100	0.189	0.201
E2	5.674	5.950	0.223	0.234
k	1.100	1.500	0.043	0.059
b	0.250	0.490	0.010	0.019
e	1.170	1.370		
L	0.510	0.711	0.020	0.028
θ	6°	14°	6°	14°